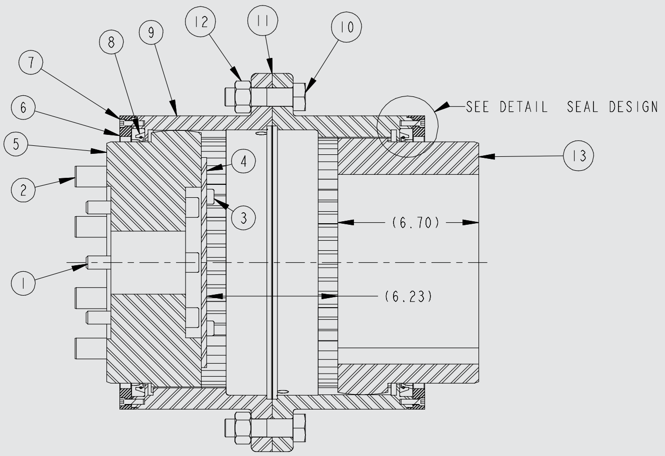
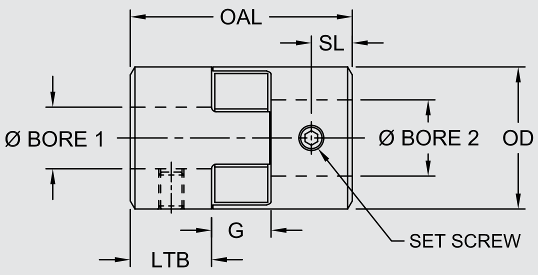
where the world turns for
Lovejoy®
Couplings

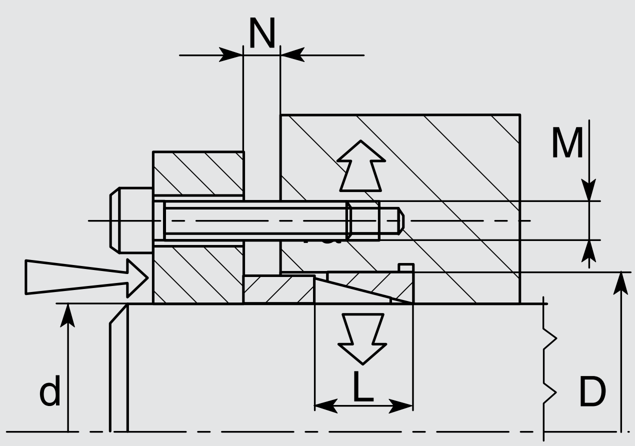
Engineering Data



In This Section:

- Misalignment Fundamentals
- U.S. Inch Clearance / Interference Fit Standards
- Keyway Recommendations
- Lovejoy, Inc Metric Clearance / Interference Fit Standards
- IEC Motor and Nema Motor Frame Standards





Engineering Data

Safety Warning

When using Lovejoy products, you must follow these instructions and take the following precautions. Failure to do so may cause the power transmission product to break and parts to be thrown with sufficient force to cause severe injury or death.

Refer to this Lovejoy Catalog for proper selection, sizing, horsepower, torque range, and speed range of power transmission products, including elastomeric elements for couplings. Follow the installation instructions included with the product, and in the individual product catalogs for proper installation of power transmission products. Do not exceed catalog ratings.

During start up and operation of power transmission product, avoid sudden shock loads. Coupling assembly should operate quietly and smoothly. If coupling assembly vibrates or makes beating sound, shut down immediately, and recheck alignment. Shortly after initial operation and periodically thereafter, where applicable, inspect coupling assembly for: alignment, wear of elastomeric element, bolt torques, and flexing elements for signs of fatigue. Do not operate coupling assembly if alignment is improper, or where applicable, if elastomeric element is damaged, or worn to less than 75% of its original thickness.

For variable speed drives, variable speed pulley rim speeds must never exceed 10,500 feet per minute. Companion pulley speeds beyond the ratings contained in this catalog are not recommended. For Fixed Center Drives, do not start until a torque arm bracket is installed. Failure to install torque arm bracket will cause torque arm to rotate rapidly and may cause severe injury from moving parts. Do not attempt to disassemble spring loaded pulley because parts may be thrown with sufficient force to cause injury or death.

Do not use any of these power transmission products for elevators, man lifts, or other devices that carry people. If the power transmission product fails, the lift device could fall resulting in severe injury or death.

For all power transmission products, you must install suitable guards in accordance with OSHA and American Society of Mechanical Engineers Standards. Do not start power transmission product before suitable guards are in place. Failure to properly guard these products may result in severe injury or death from personnel contacting moving parts or from parts being thrown from assembly in the event the power transmission product fails.

If you have any questions, contact the Lovejoy Engineering Department at 1-630-852-0500.

where the world turns for Lovejoy® Couplings

Engineering Data

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A Brief Tutorial on Misalignment

The function of a coupling is to connect driving and driven equipment. In addition, a coupling serves to protect costly equipment from the effects of misalignment, shock loads, vibration and shaft end float. Of these factors, the most common is misalignment and end float (also known as axial misalignment).

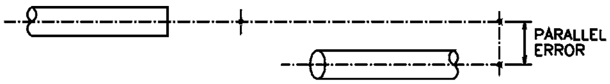
Misalignment is a condition created by two shafts whose axes are not in the same straight line. There are three forms of misalignment: parallel, angular, or the combination of the two. End float is the relative motion of two shaft ends.

Parallel misalignment occurs when the axes of the connected shafts are parallel, but not in the same straight line (figure 1). Angular misalignment occurs when the axes of the shafts intersect at the center point of the coupling (figure 2). End float occurs when one shaft moves along its axis relative to the other shaft. (figure 3)

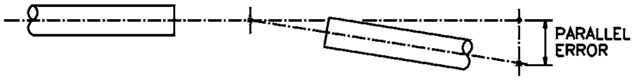
Misalignment can result from a combination of manufacturing tolerances, poor installation practices, thermal growth or shrinkage, foundation movement, and/or component wear. The combination of angular and parallel misalignment within a system may be more detrimental to the coupling and equipment than either of the individual misalignment (figure 4). Axial misalignment-result of either thrust loads, reaction loads, or heat generated movement - compounds the problem. Not understanding the amount of misalignment that the coupling must handle or installing a coupling where it exceeds a maximum rated misalignment can result in premature coupling failure and/or significant equipment damage.

Misalignment and Coupling Failure

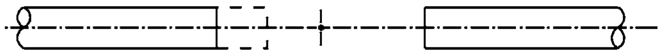
The life expectancy of a coupling is affected by the degree of misalignment. The larger the misalignment, the shorter the life of the coupling as shown in figure 5. Misalignment may cause heat generation, fatigue, and an increase in wear in bearings of the drive and driven components.



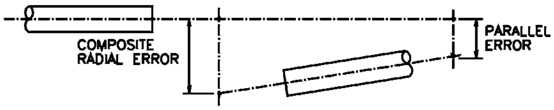
Parallel Misalignment
Figure 1



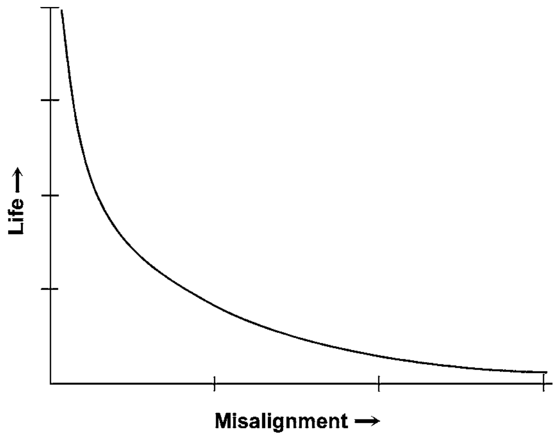
Angular Misalignment
Figure 2



Axial Misalignment
Figure 3



Composite Radial Misalignment
Figure 4



Life Versus Misalignment
Figure 5

⚠ WARNING

You must refer to page ED-2 (Page 450) for Important Safety Instructions and Precautions for the selection and use of these products. Failure to follow the instructions and precautions can result in severe injury or death.

When Misalignment Can Not be Measured

When it is not possible to measure the misalignment of a system, or in designing a new system, the following method can be used to estimate angular, parallel and combined misalignment. Each type of misalignment is first calculated and then the results are combined.

To calculate the maximum angular misalignment, the distance (L) and angle (a) must be known or estimated (see example below). First, calculate the angular misalignment noting the critical plane or midpoint of the shaft ends. Second, using the maximum parallel misalignment, be sure to consider both horizontal and vertical directions (figure 3). Maximum parallel misalignment occurs when the shafts are diagonally opposed. Third, combine the results.

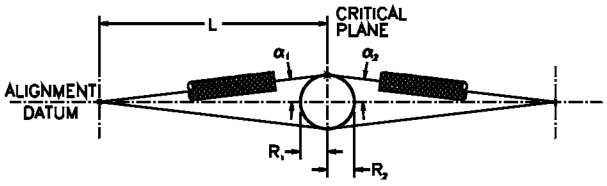


Figure 1

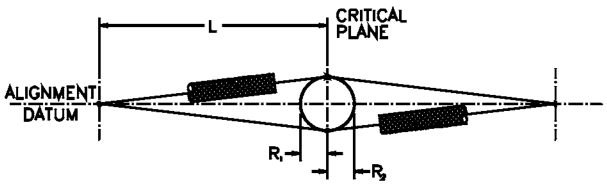


Figure 2

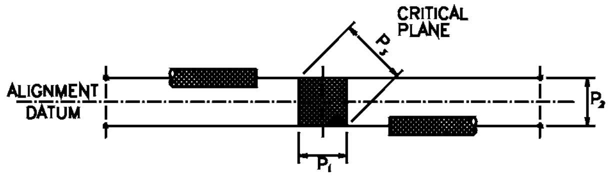


Figure 3

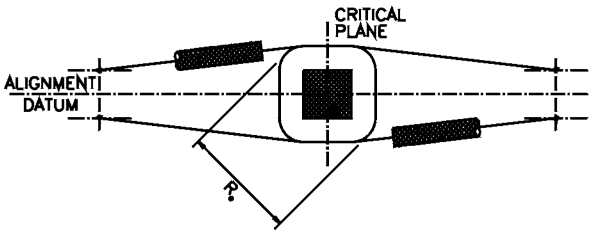


Figure 4

Worked example

Calculate the worst possible composite alignment misalignment when:

α_1 max = ±0.4°
α_2 max = ±0.4°

L max = 3 in	L max = 75 mm (LH and RH shafts)
P_1 max = 0.008 in	P_1 max = 0.2 mm
P_2 max = 0.008 in	P_2 max = 0.2 mm

1. Worst possible angular misalignment (figure 1) $= \alpha_1 + \alpha_2$
   = 0.4° +0.4°
   = 0.8°
2. Maximum radial misalignment (figure 2) = $R_1 + R_2$

   Since α_1 and α_2 are equal, $R_1 = R_2$

Calculate for 2(R_1)	= 2 (tan α_1 x L)
= 2 (tan α_1 x L)	= 2 (tan 0.4 x 75)
= 2 (tan 0.4 x 3)	= 2 (0.007 x 75)
= 2 (0.007 x 3)	= 1.05 mm
= 0.042 in	

3. Maximum parallel misalignment P_3 (figure 3)= $\sqrt{P_1^2 + P_2^2}$

= $\sqrt{0.008^2 + 0.008^2}$	= $\sqrt{0.2^2 + 0.2^2}$
= 0.0113 in	= 0.28 mm

4. Worst possible misalignment (figure 4) $R_C = R_1 + R_2 + P_3$

= 0.042 + 0.0113	= 1.05 + 0.28
= 0.0533 in	= 1.33 mm

Note: ■ Relatively minor angular misalignments can produce disproportionate radial misalignments. In this example, they account for approximately 80% of the worst possible composite misalignment.

Summary

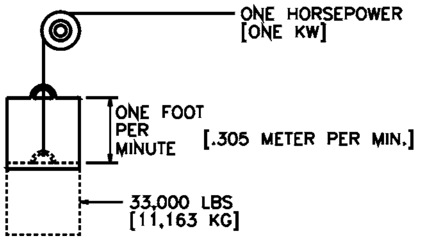
Worst possible angular misalignment	$= \alpha_1 + \alpha_2$ (figure 1)
Maximum radial misalignment	$= R_1 + R_2$ (figure 2)
Maximum parallel misalignment $\sqrt{(P_1^2 + P_2^2)}$	$= P_3$ (figure 3)
Worst possible composite radial misalignment R_C	$= R_1 + R_2 + P_3$ (figure 4)

Figures 1 through 4 represent that $\alpha_1 = \alpha_2$ and $P_1 = P_2$, and that L is the same for LH and RH shafts.

Formulas and Equations

Horsepower

One HP is the rate of work required to raise 33,000 pounds one foot in one minute.



$$HP = \frac{\text{Force x FPM}}{33{,}000} \qquad HP = \frac{\text{Torque (in pound-inches) x RPM}}{63{,}025}$$

$$HP = \frac{\text{Torque (in pound-feet) x RPM}}{5{,}252}$$

FPM = Feet per minute
RPM = Revolutions per minute

Horsepower per Hundred RPM

When the HP is given and the RPM, N, is known, HP/C is:

$$HP/C = \frac{\text{HP x 100}}{N}$$

Once HP/C is known, HP @ *N* RPM is found by HP=HP/C x N

Example:

15 HP @ 1750 RPM is:

$$HP/C = \frac{15 \times 100}{1750} = .85 \text{ HP per 100 RPM (HP/C)}$$

Using .85 HP/C, the HP rating @ 800 RPM is:

$$\frac{.85}{100} \times 800 = .85 \times 8 = 6.8 \text{ HP}$$

Kilowatts

One KW is the rate of work required to raise 11,163 kg 0.305 meter in one minute.

$$KW = \frac{\text{Nm x RPM}}{9{,}550}$$

Torque

The twisting or turning effort around a shaft tending to cause rotation. Torque is determined by multiplying the applied force by the distance from the point where force is applied to the shaft center.

TQ = F (force) x R (radius)

Inch example:

20 HP at 100 RPM = 12,605 pound-inches Torque

$$\text{Torque (in-lb)} = \frac{63{,}025 \times HP}{RPM}$$

= Force x Lever Arm (in inches)

$$\text{Torque (ft-lb)} = \frac{5{,}252 \times HP}{RPM}$$

= Force x Lever Arm (in feet)

Force = Working load in pounds
Lever Arm = Distance from the force to the center of rotation in inches or feet.

Metric example:

10 KW at 100 RPM = 955 Nm:

$$\text{Torque (Nm)} = \frac{KW \times 9{,}550}{RPM}$$

Force = Working load in Newtons
Lever Arm = Distance from the Force to the center of rotation in millimeters.

Conversions

KW x 1.341 = HP
HP x 0.7457 = KW
Nm x 0.737562 = ft-lb
Nm x 8.85 = in-lb
ft-lb x 1.356 = Nm
in-lb x 0.113 = Nm
HP x 550 = ft-lb/sec

Formulas and Equations

Overhung Loads

An overhung load is a bending force imposed on a shaft due to the torque transmitted by V-drives, chain drives and other power transmission devices, other than flexible couplings.

Most motor and reducer manufacturers list the maximum values allowable for overhung loads. These values should be compared with the load actually imposed by the connected drive.

Weights of the drive components are usually negligible. The formulas are based on the assumption that the load is applied at a point equal to one shaft diameter from the bearing face. Factor F, shown at right, depends on the type of drive used.

F =
- 1.00 for single chain drives
- 1.10 for timing belt drives
- 1.25 for spur or helical gear or double chain drives
- 1.50 for V-belt drives
- 2.50 for flat belt drives

Inch example:

Find the overhung load imposed on a reducer by a double chain drive transmitting 7 HP @ 30 RPM. The pitch diameter of the sprocket is 10 in; service factor is 1.3.

Solution:

$$O.H.L = \frac{(63{,}025)\ (7 \times 1.3)\ (1.25)}{(30)\ (5)} = 4{,}779.4 \text{ lbs}$$

$$O.H.L. = \frac{63{,}025 \times HP \times F}{N \times R}$$

HP	=	Transmitted HP x service factor
N	=	RPM of shaft
R	=	Radius of sprocket, pulley, etc.
F	=	Factor

Metric example:

Find the overhung load imposed on a reducer by a double chain drive transmitting 10 KW @ 30 RPM. The pitch diameter of the sprocket is 254 mm; service factor is 1.3.

Solution:

$$O.H.L = \frac{(376)\ (10 \times 1.3)\ (1.25)}{(30)\ (1.27)} = 160 \text{ N}$$

$$O.H.L. = \frac{376 \times KW \times F}{N \times R}$$

KW	=	Transmitted KW x service factor
N	=	RPM of shaft
R	=	Radius of sprocket, pulley, etc. (mm)
F	=	Factor

Formulas and Equations

Horsepower / Speed / Torque Relationships

HP		Speed (RPM)		Torque	
Constant	—	Increases	↑	Decreases	↓
Constant	—	Decreases	↓	Increases	↑
Increases	↑	Constant	—	Increases	↑
Decreases	↓	Constant	—	Decreases	↓
Increases	↑	Increases	↑	Constant	—
Decreases	↓	Decreases	↓	Constant	—

Electrical Formulas

To Find	Alternating Current – Single Phase	Alternating Current – Three Phase
Amperes when horsepower is known	$\frac{HP \times 746}{E \times Eff \times pf}$	$\frac{HP \times 746}{1.73 \times E \times Eff \times pf}$
Amperes when kilowatts are known	$\frac{KW \times 1{,}000}{E \times pf}$	$\frac{KW \times 1{,}000}{1.73 \times E \times pf}$
Amperes when Kva are known	$\frac{Kva \times 1{,}000}{E}$	$\frac{Kva \times 1{,}000}{1.73 \times E}$
Kilowatts	$\frac{I \times E \times pf}{1{,}000}$	$\frac{1.73 \times I \times E \times pf}{1{,}000}$
Kva	$\frac{I \times E}{1{,}000}$	$\frac{1.73 \times I \times E}{1{,}000}$
Horsepower = (Output)	$\frac{I \times E \times Eff \times pf}{746}$	$\frac{1.73 \times I \times E \times Eff \times pf}{746}$

I = Amperes; E = Volts; Eff = Efficiency; pf = power factor; Kva = Kilovolt amperes; KW = Kilowatts; R = Ohms

To Find	Alternating or Direct Current
Amperes when voltage and resistance are known	$\frac{E}{R}$
Voltage when resistance and current are known	IR
Resistance when voltage and current are known	$\frac{E}{I}$

General Information (Approximation)

(All values at 100% load)

At 1,800 RPM, a motor develops 36 in-lb per HP
At 1,200 RPM, a motor develops 54 in-lb per HP
At 575 volts, a three-phase motor draws 1 amp per HP
At 460 volts, a three-phase motor draws 1.25 amp per HP
At 230 volts, a three-phase motor draws 2.5 amp per HP
At 230 volts, a single-phase motor draws 5 amp per HP
At 115 volts, a single-phase motor draws 10 amp per HP

Temperature conversion
Deg C = (Deg. F - 32) x 5/9
Deg F = (Deg. C x 9/5) + 32

Motor Amps @ Full Load[1]

HP	Alt Current Single-Phase	Alt Current Three-Phase	DC
1/2	4.9	2.0	2.7
1	8.0	3.4	4.8
1-1/2	10.0	4.8	6.6
2	12.0	6.2	8.5
3	17.0	8.6	12.5

HP	Alt Current Single-Phase	Alt Current Three-Phase	DC
5	28	14.4	20
7-1/2	40	21.0	29
10	50	26.0	38
15	–	38.0	56
20	–	50.0	74

HP	Alt Current Single-Phase	Alt Current Three-Phase	DC
25	–	60	92
30	–	75	110
40	–	100	146
50	–	120	180
60	–	150	215

HP	Alt Current Single-Phase	Alt Current Three-Phase	DC
75	–	180	268
100	–	240	355
125	–	300	443
150	–	360	534
200	–	480	712

Notes:
- 1 indicates: Values are for all speeds and frequencies @ 230 volts.
- Amperage other than 230 volts can be figured:

$$V = \frac{230 \times \text{Amp from Table}}{\text{New Voltage}}$$

Example:

For 60 HP, three-phase @ 550 volts: $\frac{(230 \times 150)}{550}$ = 62 amps

Power factor estimated @ 80 percent for most motors. Efficiency is usually 80 to 90 percent.

Sleeve and Flexible Element Chemical Resistance Chart

Legend: A = Fluid has little or no effect; B = Fluid has minor to moderate effect; C = Fluid has severe effect; = No data available.

Resistance to:	NBR ("SOX")	Urethane	Hytrel®	EPDM	Neoprene
Acetone	C	C	B	A	B
Ammonia Anhydrous	–	–	–	A	A
Ammonium Hydroxide Solutions	C	C	A	A	A (158°F)
ASTM oil No. 1	A	A	A	C	A
ASTM oil No. 3	A	B	A	C	B-C (158°F)
ASTM reference fuel A	A	A	A	C	B
ASTM reference fuel B	A	B	A	C	C
ASTM reference fuel C	B	C	B	C	C
Benzene	C	C	B	C	C
Butane	A	A	A	C	A
Carbon Tetrachloride	C	C	C	C	C
Chlorobenzene	C	C	C	C	C
Chloroform	C	C	C	C	C
Chromic Acid 10-50%	C	C	–	C	C
Dowtherm A or E solvent	–	–	–	C	C
Ethyl Alcohol	C	C	A	A	A (158°F)
Ethylene Glyco	A	B	A	A	A (158°F)
Fuel Oil	A	C	–	C	A
Gasoline	A	B	A	C	B
Glycerine	A	C	A	A	A
Hydraulic Oils (Petroleum Based)	A	A	A	C	A-B
Hydrochloric Acid, 37% (cold)	C	C	C	A	A-B
Hydrogen Peroxide, 90%	C	–	–	C	C
Isopropyl Alcohol	B	C	A	A	A-B
Kerosene	A	B	A	C	B-C
Lacquer Solvents (MEK)	C	C	C	C	C
Lubricating Oils	B	–	A	C	B
Methyl Alcohol	C	C	A	A	A
Mineral Oil	A	A	A	C	B
Naphtha	C	C	A	C	C
Nitric Acid, 10%	C	C	B	B	B
Nitrobenzene	C	C	C	C	C
Phenol	C	C	B	C	C
Phosphoric Acid, 20%	C	A	–	A	B
Phosphate Esters	–	–	A	C	C
Pickling Solution (20% Nitric Acid, 4% HP)	C	C	C	C	C
Soap Solutions	A	A	A	A	A(158°F)
Sodium Hydroxide, 20%	B	B	A	A	B
Stearic Acid	B	A	A	B	B (158°F)
Sulfuric Acid, up to 50%	C	C	A	B	A-B (158°F)
Sulfuric Acid, 50% to 80%	C	C	C	B	B-C
Tannic Acid, 10%	A	–	A	A	A-B
Toluene	C	C	A	C	C
Trichloroethylene	C	C	B	C	C
Turpentine	A	C	–	C	C
Water	A	–	B (158°F)	A (158°F)	A (212°F)
Xylene	C	C	B	C	C

U.S. Customary Inch - Clearance-fit and Interference-fit Bore and Keyway Standards

Bore and Keyway dimensions comply with ANSI/AGMA 9002-B04 Standard.

Nominal Bore Diameter	Clearance Bore +0.001/ -0.000	Clearance Bore Min	Clearance Bore Max	Interference Bore -0.0005/ -0.0010	Interference Bore Min	Interference Bore Max	Keyway Width +0.002/ -0.000	Keyway Height (ref)	"T"-DIM +0.015/-0.000
3/8	0.3750	0.3750	0.3760	0.3750	0.3740	0.3745	0.0938	0.0469	0.421
7/16	0.4375	0.4375	0.4385	0.4375	0.4365	0.4370	0.0938	0.0469	0.484
1/2	0.5000	0.5000	0.5010	0.5000	0.4990	0.4995	0.1250	0.0625	0.560
9/16	0.5625	0.5625	0.5635	0.5625	0.5615	0.5620	0.1250	0.0625	0.623
5/8	0.6250	0.6250	0.6260	0.6250	0.6240	0.6245	0.1875	0.0938	0.709
11/16	0.6875	0.6875	0.6885	0.6875	0.6865	0.6870	0.1875	0.0938	0.773
3/4	0.7500	0.7500	0.7510	0.7500	0.7490	0.7495	0.1875	0.0938	0.837
13/16	0.8125	0.8125	0.8135	0.8125	0.8115	0.8120	0.1875	0.0938	0.900
7/8	0.8750	0.8750	0.8760	0.8750	0.8740	0.8745	0.1875	0.0938	0.964
15/16	0.9375	0.9375	0.9385	0.9375	0.9365	0.9370	0.2500	0.1250	1.051
1	1.0000	1.0000	1.0010	1.0000	0.9990	0.9995	0.2500	0.1250	1.114
1-1/16	1.0625	1.0625	1.0635	1.0625	1.0615	1.0620	0.2500	0.1250	1.178
1-1/8	1.1250	1.1250	1.1260	1.1250	1.1240	1.1245	0.2500	0.1250	1.241
1-3/16	1.1875	1.1875	1.1885	1.1875	1.1865	1.1870	0.2500	0.1250	1.304
1-1/4	1.2500	1.2500	1.2510	1.2500	1.2490	1.2495	0.2500	0.1250	1.367
1-5/16	1.3125	1.3125	1.3135	1.3125	1.3115	1.3120	0.3125	0.1562	1.455
1-3/8	1.3750	1.3750	1.3760	1.3750	1.3740	1.3745	0.3125	0.1562	1.518

Nominal Bore Diameter	Clearance Bore +0.001/ -0.000	Clearance Bore Min	Clearance Bore Max	Interference Bore -0.0005/ -0.0010	Interference Bore Min	Interference Bore Max	Keyway Width +0.0025/-0.0000	Keyway Height (ref)	"T"-DIM +0.015/-0.000
1-7/16	1.4375	1.4375	1.4385	1.4375	1.4365	1.4370	0.3750	0.1875	1.605
1-1/2	1.5000	1.5000	1.5010	1.5000	1.4990	1.4995	0.3750	0.1875	1.669

Nominal Bore Diameter	Clearance Bore +0.001/ -0.000	Clearance Bore Min	Clearance Bore Max	Interference Bore -0.001/ -0.002	Interference Bore Min	Interference Bore Max	Keyway Width +0.0025/-0.0000	Keyway Height (ref)	"T"-DIM +0.015/-0.000
1-9/16	1.5625	1.5625	1.5635	1.5625	1.5605	1.5615	0.3750	0.1875	1.732
1-5/8	1.6250	1.6250	1.6260	1.6250	1.6230	1.6240	0.3750	0.1875	1.796
1-11/16	1.6875	1.6875	1.6885	1.6875	1.6855	1.6865	0.3750	0.1875	1.859
1-3/4	1.7500	1.7500	1.7510	1.7500	1.7480	1.7490	0.3750	0.1875	1.922
1-13/16	1.8125	1.8125	1.8135	1.8125	1.8105	1.8115	0.5000	0.2500	2.032
1-7/8	1.8750	1.8750	1.8760	1.8750	1.8730	1.8740	0.5000	0.2500	2.096
1-15/16	1.9375	1.9375	1.9385	1.9375	1.9355	1.9365	0.5000	0.2500	2.160
2	2.0000	2.0000	2.0010	2.0000	1.9980	1.9990	0.5000	0.2500	2.223

Nominal Bore Diameter	Clearance Bore +0.0015/ -0.0000	Clearance Bore Min	Clearance Bore Max	Interference Bore -0.001/ -0.002	Interference Bore Min	Interference Bore Max	Keyway Width +0.0025/-0.0000	Keyway Height (ref)	"T"-DIM +0.015/-0.000
2-1/16	2.0625	2.0625	2.0640	2.0625	2.0605	2.0615	0.5000	0.2500	2.287
2-1/8	2.1250	2.1250	2.1265	2.1250	2.1230	2.1240	0.5000	0.2500	2.350
2-3/16	2.1875	2.1875	2.1890	2.1875	2.1855	2.1865	0.5000	0.2500	2.414
2-1/4	2.2500	2.2500	2.2515	2.2500	2.2480	2.2490	0.5000	0.2500	2.477

Note: ■ Class 1 clearance fits assumed.

U.S. Customary Inch - Clearance-fit and Interference-fit Bore and Keyway Standards

Bore and Keyway dimensions comply with ANSI/AGMA 9002-B04 Standard.

	Clearance Bore			Interference Bore			Keyway		
Nominal Bore Diameter	+0.0015/ -0.0000	Min	Max	-0.001/ -0.002	Min	Max	Width +0.003/-0.000	Height (ref)	"T"-DIM +0.015/-0.000
2-5/16	2.3125	2.3125	2.3140	2.3125	2.3105	2.3115	0.6250	0.3125	2.587
2-3/8	2.3750	2.3750	2.3765	2.3750	2.3730	2.3740	0.6250	0.3125	2.651
2-7/16	2.4375	2.4375	2.4390	2.4375	2.4355	2.4365	0.6250	0.3125	2.714
2-1/2	2.5000	2.5000	2.5015	2.5000	2.4980	2.4990	0.6250	0.3125	2.778
2-9/16	2.5625	2.5625	2.5640	2.5625	2.5605	2.5615	0.6250	0.3125	2.841
2-5/8	2.6250	2.6250	2.6265	2.6250	2.6230	2.6240	0.6250	0.3125	2.905
2-11/16	2.6875	2.6875	2.6890	2.6875	2.6855	2.6865	0.6250	0.3125	2.968
2-3/4	2.7500	2.7500	2.7515	2.7500	2.7480	2.7490	0.6250	0.3125	3.032
2-13/16	2.8125	2.8125	2.8140	2.8125	2.8105	2.8115	0.7500	0.3750	3.142
2-7/8	2.8750	2.8750	2.8765	2.8750	2.8730	2.8740	0.7500	0.3750	3.205
2-15/16	2.9375	2.9375	2.9390	2.9375	2.9355	2.9365	0.7500	0.3750	3.269
3	3.0000	3.0000	3.0015	3.0000	2.9980	2.9990	0.7500	0.3750	3.332

	Clearance Bore			Interference Bore			Keyway		
Nominal Bore Diameter	+0.0015/ -0.0000	Min	Max	-0.0015/ -0.0030	Min	Max	Width +0.003/-0.000	Height (ref)	"T"-DIM +0.015/-0.000
3-1/16	3.0625	3.0625	3.0640	3.0625	3.0595	3.0610	0.7500	0.3750	3.396
3-1/8	3.1250	3.1250	3.1265	3.1250	3.1220	3.1235	0.7500	0.3750	3.459
3-3/16	3.1875	3.1875	3.1890	3.1875	3.1845	3.1860	0.7500	0.3750	3.523
3-1/4	3.2500	3.2500	3.2515	3.2500	3.2470	3.2485	0.7500	0.3750	3.586
3-5/16	3.3125	3.3125	3.3140	3.3125	3.3095	3.3110	0.8750	0.4375	3.696
3-3/8	3.3750	3.3750	3.3765	3.3750	3.3720	3.3735	0.8750	0.4375	3.760
3-7/16	3.4375	3.4375	3.4390	3.4375	3.4345	3.4360	0.8750	0.4375	3.823
3-1/2	3.5000	3.5000	3.5015	3.5000	3.4970	3.4985	0.8750	0.4375	3.887
3-9/16	3.5625	3.5625	3.5640	3.5625	3.5595	3.5610	0.8750	0.4375	3.950
3-5/8	3.6250	3.6250	3.6265	3.6250	3.6220	3.6235	0.8750	0.4375	4.014
3-11/16	3.6875	3.6875	3.6890	3.6875	3.6845	3.6860	0.8750	0.4375	4.077
3-3/4	3.7500	3.7500	3.7515	3.7500	3.7470	3.7485	0.8750	0.4375	4.141
3-13/16	3.8125	3.8125	3.8140	3.8125	3.8095	3.8110	1.0000	0.5000	4.251
3-7/8	3.8750	3.8750	3.8765	3.8750	3.8720	3.8735	1.0000	0.5000	4.314
3-15/16	3.9375	3.9375	3.9390	3.9375	3.9345	3.9360	1.0000	0.5000	4.378
4	4.0000	4.0000	4.0015	4.0000	3.9970	3.9985	1.0000	0.5000	4.441

	Clearance Bore			Interference Bore			Keyway		
Nominal Bore Diameter	+0.0015/ -0.0000	Min	Max	-0.0020/ -0.0035	Min	Max	Width +0.003/-0.000	Height (ref)	"T"-DIM +0.015/-0.000
4-1/16	4.0625	4.0625	4.0640	4.0625	4.0590	4.0605	1.0000	0.5000	4.505
4-1/8	4.1250	4.1250	4.1265	4.1250	4.1215	4.1230	1.0000	0.5000	4.568
4-3/16	4.1875	4.1875	4.1890	4.1875	4.1840	4.1855	1.0000	0.5000	4.632
4-1/4	4.2500	4.2500	4.2515	4.2500	4.2465	4.2480	1.0000	0.5000	4.695
4-5/16	4.3125	4.3125	4.3140	4.3125	4.3090	4.3105	1.0000	0.5000	4.759
4-3/8	4.3750	4.3750	4.3765	4.3750	4.3715	4.3730	1.0000	0.5000	4.822
4-7/16	4.4375	4.4375	4.4390	4.4375	4.4340	4.4355	1.0000	0.5000	4.885
4-1/2	4.5000	4.5000	4.5015	4.5000	4.4965	4.4980	1.0000	0.5000	4.949

Note: ■ Class 1 clearance fits assumed.

U.S. Customary Inch - Clearance-fit and Interference-fit Bore and Keyway Standards

Bore and Keyway dimensions comply with ANSI/AGMA 9002-B04 Standard.

	Clearance Bore			Interference Bore			Keyway		
Nominal Bore Diameter	+0.0015/ -0.0000	Min	Max	-0.0020/ -0.0035	Min	Max	Width +0.0035/-0.0000	Height (ref)	"T"-DIM +0.015/-0.000
4-9/16	4.5625	4.5625	4.5640	4.5625	4.5590	4.5605	1.2500	0.6250	5.105
4-5/8	4.6250	4.6250	4.6265	4.6250	4.6215	4.6230	1.2500	0.6250	5.169
4-11/16	4.6875	4.6875	4.6890	4.6875	4.6840	4.6855	1.2500	0.6250	5.233
4-3/4	4.7500	4.7500	4.7515	4.7500	4.7465	4.7480	1.2500	0.6250	5.296
4-13/16	4.8125	4.8125	4.8140	4.8125	4.8090	4.8105	1.2500	0.6250	5.360
4-7/8	4.8750	4.8750	4.8765	4.8750	4.8715	4.8730	1.2500	0.6250	5.424
4-15/16	4.9375	4.9375	4.9390	4.9375	4.9340	4.9355	1.2500	0.6250	5.487
5	5.0000	5.0000	5.0015	5.0000	4.9965	4.9980	1.2500	0.6250	5.551

	Clearance Bore			Interference Bore			Keyway		
Nominal Bore Diameter	+0.0015/ -0.0000	Min	Max	-0.0020/ -0.0040	Min	Max	Width +0.0035/-0.0000	Height (ref)	"T"-DIM +0.015/-0.000
5-1/16	5.0625	5.0625	5.0640	5.0625	5.0585	5.0600	1.2500	0.6250	5.614
5-1/8	5.1250	5.1250	5.1265	5.1250	5.1210	5.1225	1.2500	0.6250	5.678
5-3/16	5.1875	5.1875	5.1890	5.1875	5.1835	5.1850	1.2500	0.6250	5.741
5-1/4	5.2500	5.2500	5.2515	5.2500	5.2460	5.2475	1.2500	0.6250	5.805
5-5/16	5.3125	5.3125	5.3140	5.3125	5.3085	5.3100	1.2500	0.6250	5.868
5-3/8	5.3750	5.3750	5.3765	5.3750	5.3710	5.3725	1.2500	0.6250	5.931
5-7/16	5.4375	5.4375	5.4390	5.4375	5.4335	5.4350	1.2500	0.6250	5.995
5-1/2	5.5000	5.5000	5.5015	5.5000	5.4960	5.4975	1.2500	0.6250	6.058
5-9/16	5.5625	5.5625	5.5640	5.5625	5.5585	5.5600	1.5000	0.7500	6.214
5-5/8	5.6250	5.6250	5.6265	5.6250	5.6210	5.6225	1.5000	0.7500	6.278
5-11/16	5.6875	5.6875	5.6890	5.6875	5.6835	5.6850	1.5000	0.7500	6.342
5-3/4	5.7500	5.7500	5.7515	5.7500	5.7460	5.7475	1.5000	0.7500	6.405
5-13/16	5.8125	5.8125	5.8140	5.8125	5.8085	5.8100	1.5000	0.7500	6.469
5-7/8	5.8750	5.8750	5.8765	5.8750	5.8710	5.8725	1.5000	0.7500	6.533
5-15/16	5.9375	5.9375	5.9390	5.9375	5.9335	5.9350	1.5000	0.7500	6.596
6	6.0000	6.0000	6.0015	6.0000	5.9960	5.9975	1.5000	0.7500	6.660
6-1/16	6.0625	6.0625	6.0640	6.0625	6.0585	6.0600	1.5000	0.7500	6.723
6-1/8	6.1250	6.1250	6.1265	6.1250	6.1210	6.1225	1.5000	0.7500	6.787
6-3/16	6.1875	6.1875	6.1890	6.1875	6.1835	6.1850	1.5000	0.7500	6.850
6-1/4	6.2500	6.2500	6.2515	6.2500	6.2460	6.2475	1.5000	0.7500	6.914
6-5/16	6.3125	6.3125	6.3140	6.3125	6.3085	6.3100	1.5000	0.7500	6.977
6-3/8	6.3750	6.3750	6.3765	6.3750	6.3710	6.3725	1.5000	0.7500	7.041
6-7/16	6.4375	6.4375	6.4390	6.4375	6.4335	6.4350	1.5000	0.7500	7.104
6-1/2	6.5000	6.5000	6.5015	6.5000	6.4960	6.4975	1.5000	0.7500	7.167

	Clearance Bore	Interference Bore			Keyway		
Nominal Bore Diameter	No Standard Tolerance	-0.0020/ -0.0040	Min	Max	Width +0.004/-0.000	Height (ref)	"T"-DIM +0.015/-0.000
6-9/16		6.5625	6.5585	6.5600	1.7500	0.7500	7.199
6-5/8		6.6250	6.6210	6.6225	1.7500	0.7500	7.262
6-11/16		6.6875	6.6835	6.6850	1.7500	0.7500	7.326
6-3/4		6.7500	6.7460	6.7475	1.7500	0.7500	7.390
6-13/16		6.8125	6.8085	6.8100	1.7500	0.7500	7.453
6-7/8		6.8750	6.8710	6.8725	1.7500	0.7500	7.517
6-15/16		6.9375	6.9335	6.9350	1.7500	0.7500	7.580
7		7.0000	6.9960	6.9975	1.7500	0.7500	7.644

Notes:
- Class 1 clearance fits assumed; no standards for clearance fit above 6-1/2 inches.
- Clearance fit bore tolerance is +.002/-.000 for cast iron components on bores above 4-1/2 inches.

U.S. Customary Inch - Clearance-fit and Interference-fit Bore and Keyway Standards

Bore and Keyway dimensions comply with ANSI/AGMA 9002-B04 Standard.

Nominal Bore Diameter	Interference Bore -0.003/ -0.005	Min	Max	Keyway Width +0.004/-0.000	Height (ref)	"T"-DIM +0.015/-0.000
7-1/8	7.1250	7.1200	7.1220	1.7500	0.7500	7.771
7-1/4	7.2500	7.2450	7.2470	1.7500	0.7500	7.898
7-3/8	7.3750	7.3700	7.3720	1.7500	0.7500	8.025
7-1/2	7.5000	7.4950	7.4970	1.7500	0.7500	8.151
7-5/8	7.6250	7.6200	7.6220	2.0000	0.7500	8.247
7-3/4	7.7500	7.7450	7.7470	2.0000	0.7500	8.374
7-7/8	7.8750	7.8700	7.8720	2.0000	0.7500	8.501
8	8.0000	7.9950	7.9970	2.0000	0.7500	8.628

Nominal Bore Diameter	Interference Bore -0.0035/ -0.0055	Min	Max	Keyway Width +0.004/-0.000	Height (ref)	"T"-DIM +0.015/-0.000
8-1/8	8.1250	8.1195	8.1215	2.0000	0.7500	8.755
8-1/4	8.2500	8.2445	8.2465	2.0000	0.7500	8.882
8-3/8	8.3750	8.3695	8.3715	2.0000	0.7500	9.009
8-1/2	8.5000	8.4945	8.4965	2.0000	0.7500	9.136
8-5/8	8.6250	8.6195	8.6215	2.0000	0.7500	9.262
8-3/4	8.7500	8.7445	8.7465	2.0000	0.7500	9.389
8-7/8	8.8750	8.8695	8.8715	2.0000	0.7500	9.516
9	9.0000	8.9945	8.9965	2.0000	0.7500	9.642

Nominal Bore Diameter	Interference Bore -0.004/ -0.006	Min	Max	Keyway Width +0.004/-0.000	Height (ref)	"T"-DIM +0.015/-0.000
9-1/8	9.1250	9.1190	9.1210	2.5000	0.8750	9.830
9-1/4	9.2500	9.2440	9.2460	2.5000	0.8750	9.958
9-3/8	9.3750	9.3690	9.3710	2.5000	0.8750	10.085
9-1/2	9.5000	9.4940	9.4960	2.5000	0.8750	10.213
9-5/8	9.6250	9.6190	9.6210	2.5000	0.8750	10.340
9-3/4	9.7500	9.7440	9.7460	2.5000	0.8750	10.467
9-7/8	9.8750	9.8690	9.8710	2.5000	0.8750	10.594
10	10.0000	9.9940	9.9960	2.5000	0.8750	10.721

Nominal Bore Diameter	Interference Bore -0.0045/ -0.0065	Min	Max	Keyway Width +0.004/-0.000	Height (ref)	"T"-DIM +0.015/-0.000
10-1/8	10.1250	10.1185	10.1205	2.5000	0.8750	10.848
10-1/4	10.2500	10.2435	10.2455	2.5000	0.8750	10.975
10-3/8	10.3750	10.3685	10.3705	2.5000	0.8750	11.102
10-1/2	10.5000	10.4935	10.4955	2.5000	0.8750	11.229
10-5/8	10.6250	10.6185	10.6205	2.5000	0.8750	11.356
10-3/4	10.7500	10.7435	10.7455	2.5000	0.8750	11.483
10-7/8	10.8750	10.8685	10.8705	2.5000	0.8750	11.609
11	11.0000	10.9935	10.9955	2.5000	0.8750	11.736

Note: ■ No standard for clearance fit above 6-1/2 inches; please contact Lovejoy Technical Support.

U.S. Customary Inch - Clearance-fit and Interference-fit Bore and Keyway Standards

Bore and Keyway dimensions comply with ANSI/AGMA 9002-B04 Standard.

Nominal Bore Diameter	Interference Bore -0.005/ -0.007	Min	Max	Keyway Width +0.004/-0.000	Height (ref)	"T"-DIM +0.015/-0.000
11-1/4	11.2500	11.2430	11.2450	3.0000	1.0000	12.051
11-1/2	11.5000	11.4930	11.4950	3.0000	1.0000	12.306
11-3/4	11.7500	11.7430	11.7450	3.0000	1.0000	12.560
12	12.0000	11.9930	11.9950	3.0000	1.0000	12.814

Nominal Bore Diameter	Interference Bore -0.0055/ -0.0075	Min	Max	Keyway Width +0.004/-0.000	Height (ref)	"T"-DIM +0.015/-0.000
12-1/4	12.2500	12.2425	12.2445	3.0000	1.0000	13.068
12-1/2	12.5000	12.4925	12.4945	3.0000	1.0000	13.322
12-3/4	12.7500	12.7425	12.7445	3.0000	1.0000	13.576
13	13.0000	12.9925	12.9945	3.0000	1.0000	13.830

Nominal Bore Diameter	Interference Bore -0.0065/ -0.0085	Min	Max	Keyway Width +0.004/-0.000	Height (ref)	"T"-DIM +0.015/-0.000
13-1/4	13.2500	13.2415	13.2435	3.5000	1.2500	14.270
13-1/2	13.5000	13.4915	13.4935	3.5000	1.2500	14.524
13-3/4	13.7500	13.7415	13.7435	3.5000	1.2500	14.779
14	14.0000	13.9915	13.9935	3.5000	1.2500	15.033

Nominal Bore Diameter	Interference Bore -0.007/ -0.009	Min	Max	Keyway Width +0.004/-0.000	Height (ref)	"T"-DIM +0.015/-0.000
14-1/4	14.2500	14.2410	14.2430	3.5000	1.2500	15.287
14-1/2	14.5000	14.4910	14.4930	3.5000	1.2500	15.541
14-3/4	14.7500	14.7410	14.7430	3.5000	1.2500	15.794
15	15.0000	14.9910	14.9930	3.5000	1.2500	16.048

Nominal Bore Diameter	Interference Bore -0.0075/ -0.0100	Min	Max	Keyway Width +0.004/-0.000	Height (ref)	"T"-DIM +0.015/-0.000
15-1/4	15.2500	15.2400	15.2425	4.0000	1.5000	16.488
15-1/2	15.5000	15.4900	15.4925	4.0000	1.5000	16.742
15-3/4	15.7500	15.7400	15.7425	4.0000	1.5000	16.997
16	16.0000	15.9900	15.9925	4.0000	1.5000	17.251

Nominal Bore Diameter	Interference Bore -0.0080/ -0.0105	Min	Max	Keyway Width +0.004/-0.000	Height (ref)	"T"-DIM +0.015/-0.000
16-1/4	16.2500	16.2395	16.2420	4.0000	1.5000	17.505
16-1/2	16.5000	16.4895	16.4920	4.0000	1.5000	17.759
16-3/4	16.7500	16.7395	16.7420	4.0000	1.5000	18.013
17	17.0000	16.9895	16.9920	4.0000	1.5000	18.266

Nominal Bore Diameter	Interference Bore -0.0085/ -0.0110	Min	Max	Keyway Width +0.004/-0.000	Height (ref)	"T"-DIM +0.015/-0.000
17-1/4	17.2500	17.2390	17.2415	4.0000	1.5000	18.520
17-1/2	17.5000	17.4890	17.4915	4.0000	1.5000	18.773
17-3/4	17.7500	17.7390	17.7415	4.0000	1.5000	19.027
18	18.0000	17.9890	17.9915	4.0000	1.5000	19.280

Note: ■ No standard for clearance fit above 6-1/2 inches; please contact Lovejoy Technical Support.

Recommended Keys for Bores with One Key - Inch Series

Per ANSI/AGMA 9002-B04 Standard.

Shaft Diameter		Key	Key	Key	Key
Over	To (incl)	Square	Square	Rectangular	Rectangular
0.313	0.438	.0937 x .0937	3/32 x 3/32	—	—
0.438	0.562	.1250 x .1250	1/8 x 1/8	.125 x .0937	1/8 x 3/32
0.562	0.875	.1875 x .1875	3/16 x 3/16	.1875 x .125	3/16 x 1/8
0.875	1.250	.2500 x .2500	1/4 x 1/4	.250 x .1875	1/4 x 3/16
1.250	1.375	.3125 x .3125	5/16 x 5/16	.3125 x .2500	5/16 x 1/4
1.375	1.750	.3750 x .3750	3/8 x 3/8	.3750 x .2500	3/8 x 1/4
1.750	2.250	.5000 x .5000	1/2 x 1/2	.5000 x .3750	1/2 x 3/8
2.250	2.750	.6250 x .6250	5/8 x 5/8	.6250 x .4375	5/8 x 7/16
2.750	3.250	.7500 x .7500	3/4 x 3/4	.7500 x .5000	3/4 x 1/2
3.250	3.750	.8750 x .8750	7/8 x 7/8	.8750 x .6250	7/8 x 5/5
3.750	4.500	1.0000 x 1.0000	1 x 1	1.0000 x .7500	1 x 3/4
4.500	5.500	1.2500 x 1.2500	1-1/4 x 1-1/4	1.2500 x .8750	1-1/4 x 7/8
5.500	6.500	1.5000 x 1.5000	1-1/2 x 1-1/2	1.5000 x 1.0000	1-1/2x 1
6.500	7.500	1.7500 x 1.7500	1-3/4 x 1-3/4	1.7500 x 1.5000	1-3/4 x 1-1/2
7.500	9.000	2.0000 x 2.0000	2 x 2	2.0000 x 1.5000	2 x 1-1/2
9.000	11.000	2.5000 x 2.5000	2-1/2 x 2-1/2	2.5000 x 1.7500	2-1/2 x 1-3/4
11.000	13.000	3.0000 x 3.0000	3 x 3	3.0000 x 2.0000	3 x 2
13.000	15.000	3.5000 x 3.5000	3-1/2 x 3-1/2	3.5000 x 2.5000	3-1/2 x 2-1/2
15.000	18.000	—	—	4.0000 x 3.0000	4 x 3

Note: ■ Rectangular keys preferred for bore sizes above 6½ inches.

Recommended Keys for Bores with One Key - Metric Series (mm)

Per ANSI/AGMA 9112-A04 and ISO R773 Standards.

Shaft Diameter		Key
Over	To (incl)	Width x Height
6	8	2 x 2
8	10	3 x 3
10	12	4 x 4
12	17	5 x 5
17	22	6 x 6
22	30	8 x 7
30	38	10 x 8
38	44	12 x 8
44	50	14 x 9
50	58	16 x 10
58	65	18 x 11
65	75	20 x 12
75	85	22 x 14

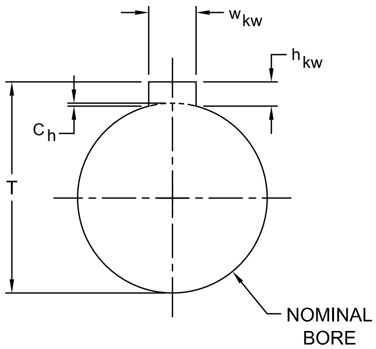
Shaft Diameter		Key
Over	To (incl)	Width x Height
85	95	25 x 14
95	110	28 x 16
110	130	32 x 18
130	150	36 x 20
150	170	40 x 22
170	200	45 x 25
200	230	50 x 28
230	260	56 x 32
260	290	63 x 32
290	330	70 x 36
330	380	80 x 40
380	440	90 x 45
440	500	100 x 50

Inch Series: hub keyway depth is one-half the nominal height of the key and measured from the side corner. The dimension from the top of the keyway to the opposite bore side, "T-dim", is calculated from (refer to ANSI/AGMA 9002-B04) the following:

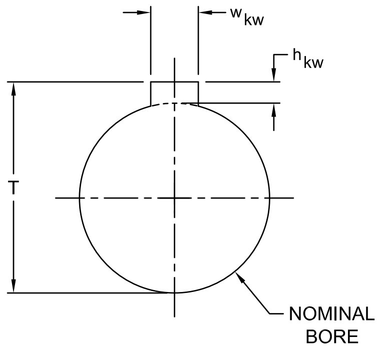
T = bore + (hkw – Ch)

Metric Series: hub keyway depth is not one-half of the nominal height of the key. Keyway depth is calculated to the top of the bore and cannot be determined by direct measurement. The "T-dim" from the top of the keyway to the opposite bore side is calculated from (refer to ANSI/AGMA 9112-A04) the following:

T = bore + hkw



Inch Series



Metric Series

Recommended Bores for Metric Shafts (mm)

Per ANSI/AGMA 9112-A04; ISO/R775:1969 Standards

Nominal Shaft Diameter			Bore Diameter Tolerance		
Over	**To (incl)**	**Tolerance**	**Clearance**	**Transitional**	**Interference**
incl 12	18	j6	F7	H7	M6
18	30	j6	F7	H7	M6
30	50	k6	F7	H7	K6
50	80	m6	F7	H7	K7
80	100	m6	F7	H7	M7
100	120	m6	F7	H7	P7
120	180	m6	F7	H7	P7
180	200	m6	F7	H7	P7
200	225	m6	F7	H7	R7
225	250	m6	F7	H7	R7
250	280	m6	F7	H7	R7
280	315	m6	F7	H7	R7
315	355	m6	F7	H7	R7
355	400	m6	F7	H7	R8
400	450	m6	F7	H7	R8
450	500	m6	F7	H7	R8

Lovejoy, Inc. Customary Metric Clearance-fit and Interference-fit Bore and Keyway Standards (millimeters)

Keyway Tolerances per ISO 286-2

Lovejoy, Inc. assumes H7 tolerances as standard clearance and P7 tolerances as standard interference fits if shaft and/or bore tolerances are not specified.

Nominal Bore Diameter	Clearance Bore H7 Bore (+0.000/+0.015) Min	Max	Interference Bore P7 Bore (-0.009/-0.024) Min	Max	Keyway Width (Js9) +/- 0.0125	Min	Max	Height Nominal	"T"-DIM +0.1/-0.0
8	8.000	8.015	7.976	7.991	2	1.988	2.013	1	9.00
9	9.000	9.015	8.976	8.991	3	2.988	3.013	1.4	10.40
10	10.000	10.015	9.976	9.991	3	2.988	3.013	1.4	11.40

Nominal Bore Diameter	Clearance Bore H7 Bore (+0.000/+0.018) Min	Max	Interference Bore P7 Bore (-0.011/-0.029) Min	Max	Keyway Width (Js9) +/- 0.0150	Min	Max	Height Nominal	"T"-DIM +0.1/-0.0
11	11.000	11.018	10.971	10.989	4	3.985	4.015	1.8	12.80
12	12.000	12.018	11.971	11.989	4	3.985	4.015	1.8	13.80
13	13.000	13.018	12.971	12.989	5	4.985	5.015	2.3	15.30
14	14.000	14.018	13.971	13.989	5	4.985	5.015	2.3	16.30
15	15.000	15.018	14.971	14.989	5	4.985	5.015	2.3	17.30
16	16.000	16.018	15.971	15.989	5	4.985	5.015	2.3	18.30
17	17.000	17.018	16.971	16.989	5	4.985	5.015	2.3	19.30
18	18.000	18.018	17.971	17.989	6	5.985	6.015	2.8	20.80

Nominal Bore Diameter	Clearance Bore H7 Bore (+0.000/+0.021) Min	Max	Interference Bore P7 Bore (-0.014/-0.035) Min	Max	Keyway Width (Js9) +/- 0.0150	Min	Max	Height Nominal	"T"-DIM +0.1/-0.0
19	19.000	19.021	18.965	18.986	6	5.985	6.015	2.8	21.80
20	20.000	20.021	19.965	19.986	6	5.985	6.015	2.8	22.80
21	21.000	21.021	20.965	20.986	6	5.985	6.015	2.8	23.80
22	22.000	22.021	21.965	21.986	6	5.985	6.015	2.8	24.80

Nominal Bore Diameter	Clearance Bore H7 Bore (+0.000/+0.021) Min	Max	Interference Bore P7 Bore (-0.014/-0.035) Min	Max	Keyway Width (Js9) +/- 0.0180	Min	Max	Height Nominal	"T"-DIM +0.25/-0.00
23	23.000	23.021	22.965	22.986	8	7.982	8.018	3.3	26.30
24	24.000	24.021	23.965	23.986	8	7.982	8.018	3.3	27.30
25	25.000	25.021	24.965	24.986	8	7.982	8.018	3.3	28.30
26	26.000	26.021	25.965	25.986	8	7.982	8.018	3.3	29.30
27	27.000	27.021	26.965	26.986	8	7.982	8.018	3.3	30.30
28	28.000	28.021	27.965	27.986	8	7.982	8.018	3.3	31.30
29	29.000	29.021	28.965	28.986	8	7.982	8.018	3.3	32.30
30	30.000	30.021	29.965	29.986	8	7.982	8.018	3.3	33.30

Nominal Bore Diameter	Clearance Bore H7 Bore (+0.000/+0.025) Min	Max	Interference Bore P7 Bore (-0.017/-0.042) Min	Max	Keyway Width (Js9) +/- 0.0180	Min	Max	Height Nominal	"T"-DIM +0.25/-0.00
32	32.000	32.025	31.958	31.983	10	9.982	10.018	3.3	35.30
35	35.000	35.025	34.958	34.983	10	9.982	10.018	3.3	38.30
38	38.000	38.025	37.958	37.983	10	9.982	10.018	3.3	41.30

Nominal Bore Diameter	Clearance Bore H7 Bore (+0.000/+0.025) Min	Max	Interference Bore P7 Bore (-0.017/-0.042) Min	Max	Keyway Width (Js9) +/- 0.0215	Min	Max	Height Nominal	"T"-DIM +0.25/-0.00
40	40.000	40.025	39.958	39.983	12	11.979	12.022	3.3	43.30
42	42.000	42.025	41.958	41.983	12	11.979	12.022	3.3	45.30
45	45.000	45.025	44.958	44.983	14	13.979	14.022	3.8	48.80
48	48.000	48.025	47.958	47.983	14	13.979	14.022	3.8	51.80
50	50.000	50.025	49.958	49.983	14	13.979	14.022	3.8	53.80

Lovejoy, Inc. Customary Metric Clearance-fit and Interference-fit Bore and Keyway Standards (millimeters)

Keyway Tolerances per ISO 286-2

Lovejoy, Inc. assumes H7 tolerances as standard clearance and P7 tolerances as standard interference fits if shaft and/or bore tolerances are not specified.

Nominal Bore Diameter	Clearance Bore H7 Bore (+0.000/+0.030) Min	Max	Interference Bore P7 Bore (-0.021/-0.051) Min	Max	Keyway Width (Js9) +/- 0.0215	Min	Max	Height Nominal	"T"-DIM +0.25/-0.00
55	55.000	55.030	54.949	54.979	16	15.979	16.022	4.3	59.30
56	56.000	56.030	55.949	55.979	16	15.979	16.022	4.3	60.30
60	60.000	60.030	59.949	59.979	18	17.979	18.022	4.4	64.40
63	63.000	63.030	62.949	62.979	18	17.979	18.022	4.4	67.40
65	65.000	65.030	64.949	64.979	18	17.979	18.022	4.4	69.40

Nominal Bore Diameter	Clearance Bore H7 Bore (+0.000/+0.030) Min	Max	Interference Bore P7 Bore (-0.021/-0.051) Min	Max	Keyway Width (Js9) +/- 0.0260	Min	Max	Height Nominal	"T"-DIM +0.25/-0.00
70	70.000	70.030	69.949	69.979	20	19.974	20.026	4.9	74.90
71	71.000	71.030	70.949	70.979	20	19.974	20.026	4.9	75.90
75	75.000	75.030	74.949	74.979	20	19.974	20.026	4.9	79.90
80	80.000	80.030	79.949	79.979	22	21.974	22.026	5.4	85.40

Nominal Bore Diameter	Clearance Bore H7 Bore (+0.000/+0.035) Min	Max	Interference Bore P7 Bore (-0.024/-0.059) Min	Max	Keyway Width (Js9) +/- 0.0260	Min	Max	Height Nominal	"T"-DIM +0.25/-0.00
85	85.000	85.035	84.941	84.976	22	21.974	22.026	5.4	90.40
90	90.000	90.035	89.941	89.976	25	24.974	25.026	5.4	95.40
95	95.000	95.035	94.941	94.976	25	24.974	25.026	5.4	100.40
100	100.000	100.035	99.941	99.976	28	27.974	28.026	6.4	106.40
110	110.000	110.035	109.941	109.976	28	27.974	28.026	6.4	116.40

Nominal Bore Diameter	Clearance Bore H7 Bore (+0.000/+0.035) Min	Max	Interference Bore P7 Bore (-0.024/-0.059) Min	Max	Keyway Width (Js9) +/- 0.0310	Min	Max	Height Nominal	"T"-DIM +0.25/-0.00
115	115.000	115.035	114.941	114.976	32	31.969	32.031	7.4	122.40
120	120.000	120.035	119.941	119.976	32	31.969	32.031	7.4	127.40

Nominal Bore Diameter	Clearance Bore H7 Bore (+0.000/+0.040) Min	Max	Interference Bore P7 Bore (-0.028/-0.068) Min	Max	Keyway Width (Js9) +/- 0.0310	Min	Max	Height Nominal	"T"-DIM +0.25/-0.00
125	125.000	125.040	124.932	124.972	32	31.969	32.031	7.4	132.40
130	130.000	130.040	129.932	129.972	32	31.969	32.031	7.4	137.40

Nominal Bore Diameter	Clearance Bore H7 Bore (+0.000/+0.040) Min	Max	Interference Bore P7 Bore (-0.028/-0.068) Min	Max	Keyway Width (Js9) +/- 0.0310	Min	Max	Height Nominal	"T"-DIM +0.30/-0.00
140	140.000	140.040	139.932	139.972	36	35.969	36.031	8.4	148.40
150	150.000	150.040	149.932	149.972	36	35.969	36.031	8.4	158.40
160	160.000	160.040	159.932	159.972	40	39.969	40.031	9.4	169.40
170	170.000	170.040	169.932	169.972	40	39.969	40.031	9.4	179.40
180	180.000	180.040	179.932	179.972	45	44.969	45.031	10.4	190.40

Nominal Bore Diameter	Clearance Bore H7 Bore (+0.000/+0.046) Min	Max	Interference Bore P7 Bore (-0.033/-0.079) Min	Max	Keyway Width (Js9) +/- 0.0310	Min	Max	Height Nominal	"T"-DIM +0.30/-0.00
190	190.000	190.046	189.921	189.967	45	44.969	45.031	10.4	200.40
200	200.000	200.046	199.921	199.967	45	44.969	45.031	10.4	210.40
210	210.000	210.046	209.921	209.967	50	49.969	50.031	11.4	221.40
220	220.000	220.046	219.921	219.967	50	49.969	50.031	11.4	231.40
225	225.000	225.046	224.921	224.967	50	49.969	50.031	11.4	236.40
230	230.000	230.046	229.921	229.967	50	49.969	50.031	11.4	241.40

Lovejoy, Inc. Customary Metric Clearance-fit and Interference-fit Bore and Keyway Standards (millimeters)

Keyway Tolerances per ISO 286-2

Lovejoy, Inc. assumes H7 tolerances as standard clearance and P7 tolerances as standard interference fits if shaft and/or bore tolerances are not specified.

Nominal Bore	Clearance Bore		Interference Bore		Keyway				"T"-DIM
	H7 Bore (+0.000/+0.046)		P7 Bore (-0.033/-0.079)		Width (Js9)			Height	
Diameter	Min	Max	Min	Max	+/- 0.0370	Min	Max	Nominal	+0.30/-0.00
240	240.000	240.046	239.921	239.967	56	55.963	56.037	12.4	252.40
250	250.000	250.046	249.921	249.967	56	55.963	56.037	12.4	262.40

Nominal Bore	Clearance Bore		Interference Bore		Keyway				"T"-DIM
	H7 Bore (+0.000/+0.052)		P7 Bore (-0.036/-0.088)		Width (Js9)			Height	
Diameter	Min	Max	Min	Max	+/- 0.0370	Min	Max	Nominal	+0.30/-0.00
260	260.000	260.052	259.912	259.964	56	55.963	56.037	12.4	272.40
270	270.000	270.052	269.912	269.964	63	62.963	63.037	12.4	282.40
280	280.000	280.052	279.912	279.964	63	62.963	63.037	12.4	292.40
290	290.000	290.052	289.912	289.964	63	62.963	63.037	12.4	302.40
300	300.000	300.052	299.912	299.964	70	69.963	70.037	14.4	314.40
310	310.000	310.052	309.912	309.964	70	69.963	70.037	14.4	324.40
315	315.000	315.052	314.912	314.964	70	69.963	70.037	14.4	329.40

Nominal Bore	Clearance Bore		Interference Bore		Keyway				"T"-DIM
	H7 Bore (+0.000/+0.057)		P7 bore (-0.041/-0.098)		Width (Js9)			Height	
Diameter	Min	Max	Min	Max	+/- 0.0370	Min	Max	Nominal	+0.30/-0.00
320	320.000	320.057	319.902	319.959	70	69.963	70.037	14.4	334.40
330	330.000	330.057	329.902	329.959	70	69.963	70.037	14.4	344.40
340	340.000	340.057	339.902	339.959	80	79.963	80.037	15.4	355.40
350	350.000	350.057	349.902	349.959	80	79.963	80.037	15.4	365.40
355	355.000	355.057	354.902	354.959	80	79.963	80.037	15.4	370.40
360	360.000	360.057	359.902	359.959	80	79.963	80.037	15.4	375.40
370	370.000	370.057	369.902	369.959	80	79.963	80.037	15.4	385.40
380	380.000	380.057	379.902	379.959	80	79.963	80.037	15.4	395.40

Nominal Bore	Clearance Bore		Interference Bore		Keyway				"T"-DIM
	H7 Bore (+0.000/+0.057)		P7 Bore (-0.041/-0.098)		Width (Js9)			Height	
Diameter	Min	Max	Min	Max	+/- 0.0435	Min	Max	Nominal	+0.30/-0.00
390	390.000	390.057	389.902	389.959	90	89.957	90.044	17.4	407.40
400	400.000	400.057	399.902	399.959	90	89.957	90.044	17.4	417.40

Nominal Bore	Clearance Bore		Interference Bore		Keyway				"T"-DIM
	H7 Bore (+0.000/+0.063)		P7 Bore (-0.045/-0.108)		Width (Js9)			Height	
Diameter	Min	Max	Min	Max	+/- 0.0435	Min	Max	Nominal	+0.30/-0.00
410	410.000	410.063	409.892	409.955	90	89.957	90.044	17.4	427.40
420	420.000	420.063	419.892	419.955	90	89.957	90.044	17.4	437.40
430	430.000	430.063	429.892	429.955	90	89.957	90.044	17.4	447.40
440	440.000	440.063	439.892	439.955	90	89.957	90.044	17.4	457.40
450	450.000	450.063	449.892	449.955	100	99.957	100.044	19.5	469.50
460	460.000	460.063	459.892	459.955	100	99.957	100.044	19.5	479.50
470	470.000	470.063	469.892	469.955	100	99.957	100.044	19.5	489.50
480	480.000	480.063	479.892	479.955	100	99.957	100.044	19.5	499.50
490	490.000	490.063	489.892	489.955	100	99.957	100.044	19.5	509.50
500	500.000	500.063	499.892	499.955	100	99.957	100.044	19.5	519.50

IEC Motor Frame Dimensional Data

IEC Frame	Type	Foot Mounting				Shaft		BS Flange						B14 Face						General			
		A	B	C	H	D	E	LA	M	N	P	S	T	M	N	P	S	T	L	AC	AD	HC	XX
63	300	**100** 3.937	**80** 3.150	**40** 1.570	**63** 2.480	**11** 0.433	**23** 0.906	**8** 0.313	**115** 4.528	**95** 3.740	**140** 5.512	**9** 0.354	**3** 0.118	**75** 2.953	**60** 2.362	**90** 3.540	M5	**2.5** 0.098	*	**119** 4.690	**102** 4 **116d** 4.567d	**121** 4.760 **136d** 5.375d	**13** 0.500 **22d** 0.880d
71	300 400	**112** 4.409	**90** 3.543	**45** 1.770	**71** 2.800	**14** 0.551	**30** 1.181	**8** 0.313	**130** 5.118	**110** 4.331	**160** 6.299	**10** 0.393	**3.5** 0.138	**85** 3.347	**70** 2.756	**105** 4.130	M6	**2.5** 0.098	*	**119** 4.690 **145d** 5.690d	**102** 4	**131** 5.140 **149d** 5.880d	**18** 0.690 **21d** 0.844d
80	400 500	**125** 4.921	**100** 3.937	**50** 1.969	**80** 3.150	**19** 0.748	**40** 1.575	**13** 0.500	**†165** 6.496	**130** 5.118	**200** 7.874	**11** 0.430	**3.5** 0.138	**100** 3.937	**80** 3.150	**120** 4.724	M6	**3** 0.118	*	**145** 5.690 **168d** 6.614d	**116** 4.510 **130** 5.120	**152** 6 **162d** 6.380d	**22** 0.880 **21d** 0.844d
90	S L	**140** 5.511	**100** 3.937 **125** 4.921	**56** 2.205	**90** 3.543	**24** 0.945	**50** 1.969	**13** 0.500	**165** 6.496	**130** 5.118	**200** 7.874	**12** 0.472	**3.5** 0.138	**115** 4.530	**95** 3.740	**140** 5.512	M8	**3** 0.118	*	**168** 6.614 **144d** 5.687d	**130** 5.120 **107d** 4.250d	**173** 6.810 **165d** 6.531d	**22** 0.880 **21d** 0.844d
100	S L	**160** 6.300	**112** 4.409 **140** 5.512	**63** 2.480	**100** 3.937	**28** 1.102	**60** 2.362	**14** 0.562	**215** 8.465	**180** 7.087	**250** 9.840	**14** 0.560	**4** 0.160	**130** 5.108	**110** 4.331	**160** 6.299	M8	**3.5** 0.138	*	**200** 7.875	**149** 5.875 **153d** 6.060d	**180** 7.906 **239d** 9.440d	**27** 1.062
112	S M	**190** 7.480	**114** 4.488 **140** 5.512	**70** 2.760	**112** 4.409	**28** 1.102	**60** 2.362	**14** 0.562	**215** 8.465	**180** 7.087	**250** 9.840	**14** 0.560	**4** 0.160	**130** 5.108	**110** 4.331	**160** 6.299	M8	**3.5** 0.138	*	**200** 7.875	**149** 5.875	**214** 8.437	**27** 1.062
132	S M	**216** 8.504	**140** 5.512 **178** 7.008	**89** 3.504	**132** 5.197	**38** 1.496	**80** 3.150	**14** 0.562	**265** 10.433	**230** 9.055	**300** 11.811	**14** 0.560	**4** 0.160	**165** 6.496	**130** 5.118	**200** 7.874	M8	**3.5** 0.138	*	**243** 9.562	**187** 7.375	**256** 10.062	**27** 1.062
160	M L	**254** 10	**210** 8.268 **254** 10	**108** 4.252	**160** 6.299	**42** 1.654	**110** 4.331	**20** 0.787	**300** 11.811	**250** 9.842	**350** 13.780	**19** 0.748	**5** 0.200	**215** 8.465	**180** 7.087	**250** 9.840	M12	**4** 0.160	*	**329** 12.940	**242** 9.510	**329** 12.940	**35** 1.375
180	M L	**279** 10.984	**241** 9.488 **279** 10.984	**121** 4.764	**180** 7.087	**48** 1.890	**110** 4.331	—	**300** 11.811	**250** 9.842	**350** 13.780	**19** 0.748	**5** 0.200	—	—	—	—	—	*	**395** 15.560	**333** 13.120	**372** 14.640	**51** 2.008
200	L M	**318** 12.520	**267** 10.512 **305** 12.008	**133** 5.236	**200** 7.874	**55** 2.165	**110** 4.331	—	**350** 13.780	**300** 11.811	**400** 15.748	**19** 0.748	—	—	—	—	—	—	*	**441** 17.375	**359** 14.125	**416** 16.375	**63** 2.500
225	S M	**356** 14.016	**286** 11.260 **311** 12.244	**149** 5.866	**225** 8.858	**60** 2.362	**140** 5.512	—	**400** 15.748	**350** 13.780	**450** 17.716	**19** 0.748	—	—	—	—	—	—	*	**495** 19.488	**383** 15.079	**483** 19.016	**63** 2.500
250	S M	**406** 15.984	**311** 12.244 **349** 13.740	**168** 6.614	**250** 9.843	**70** 2.756	**140** 5.512	—	—	—	—	—	—	—	—	—	—	—	*	**520** 20.472	**457** 17.992	**513** 20.197	**63** 2.500
280	S M	**457** 17.992	**368** 14.488 **419** 16.496	**190** 7.485	**280** 11.025	**80** 3.150	**170** 6.693	—										—	*	**616** 24.252	**497** 19.567	**581** 22.874	**63** 2.500
315	S M	**508** 20	**406** 16 **457** 18	**216** 8.500	**315** 12.400	**85** 3.346	**170** 6.693	—										—	*	**759** 29.900	**683** 26.880	**682** 26.840	**102** 4
355	S L	**610** 24	**500** 19.690 **630** 24.800	**254** 10	**355** 13.980	**85** 3.346	**170** 6.693	—										—	*	**759** 29.900	**683** 26.880	**719** 28.320	**102** 4

LEGEND

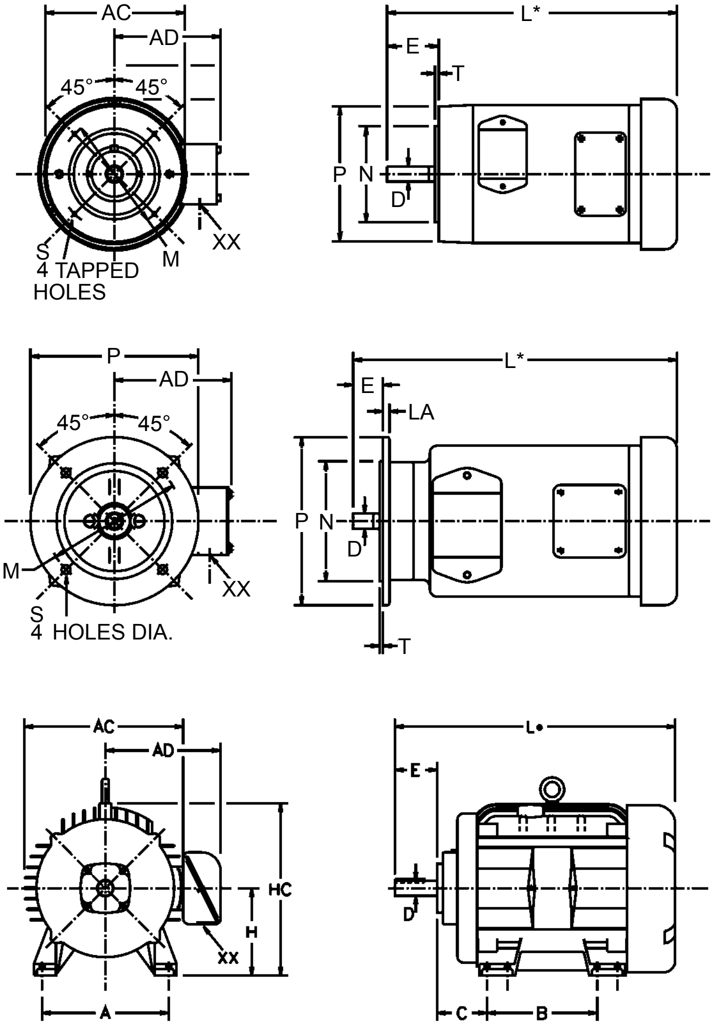
Metric dimensions (millimeters) in bold.
Inch dimensions in plain type.

d = DC Motors

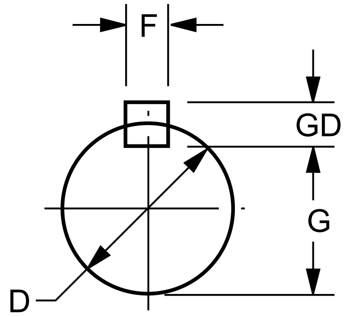
1 mm = 0.03937 inches
1 inch = 25.40 mm

Note: ■ * indicates: This dimension varies depending upon manufacturer.

IEC Motor Frame Drawings



Note: ■ Drawings represent standard TEFC general purpose motors. Dimensions are for reference only.



Key and Keyseat Dimensions

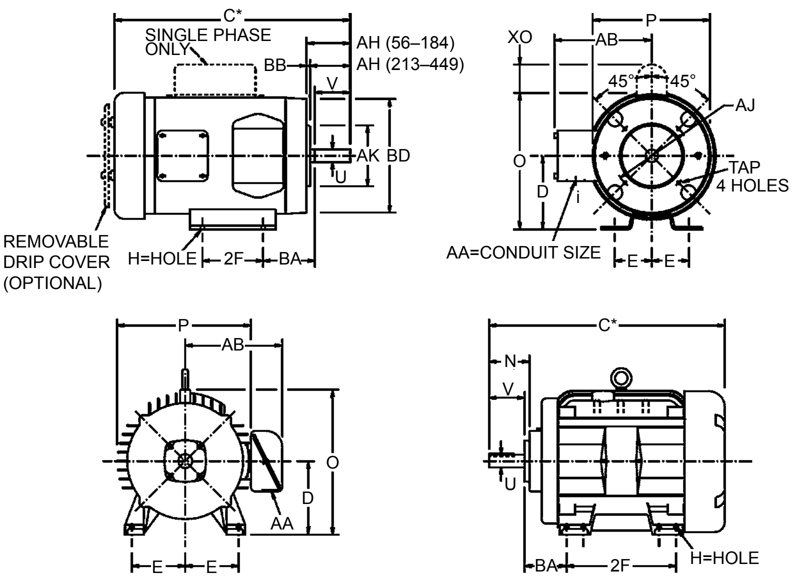
Frame	D	G	F	GD
63	11	8.5	4	4
71	14	11	5	5
80	19	15.5	6	6
90	24	20	8	7
100	28	24	8	7
112	28	24	8	7
132	38	33	10	8
160	37	42	12	8
180	48	42.5	14	9
200	55	49	16	10
225	60	53	18	11
250	65	67.5	20	12
280	80	71	22	14
315	85	76	22	14
355	85	76	22	14

NEMA Quick Reference Chart - Inch

NEMA Frame	D	E	2F	H	N	O	P	U	V	AA	AB	AH	AJ	AK	BA	BB	BD	XO	TAP
42	2-5/8	1-3/4	1-11/16	9/32*	1-1/2	5	4-11/16	3/8	1-1/8	3/8	4-1/32	1-5/16	3-3/4	3	2-7/16	1/8	4-5/8	1-9/16	1/4-20
48	3	2-1/8	2-3/4	11/32*	1-7/8	5-7/8	5-11/16	1/2	1-1/2	1/2	4-3/8	1-11/16	3-3/4	3	2-1/2	1/8	5-5/8	2-1/4	1/4-20
56 56H	3-1/2	2-7/16	3 5	11/32*	2-7/16 2-1/8	6-7/8	6-5/8	5/8	1-7/8	1/2	5	2-1/16	5-7/8	4-1/2	2¾	1/8	6-1/2	2-1/4	3/8-16
143T 145T	3-1/2	2-3/4	4 5	11/32	2-1/2	6-7/8	6-5/8	7/8	2-1/4	3/4	5-1/4	2-1/8	5-7/8	4-1/2	2-1/4	1/8	6-1/2	2-1/4	3/8-16
182 184 182T 184T	4-1/2	3-3/4	4-1/2 5-1/2 4-1/2 5-1/2	13/32	2-11/16 2-11/16 3-9/16 3-9/16	8-11/16	7-7/8	7/8 7/8 1-1/8 1-1/8	2-1/4 2-1/4 2-3/4 2-3/4	3/4	5-7/8	2-1/8 2-1/8 2-5/8 2-5/8	5-7/8 5-7/8 7-1/4 7-1/4	4-1/2 4-1/2 8-1/2 8-1/2	2-3/4	1/8 1/8 1/4 1/4	6-1/2 6-1/2 9 9	2-3/8	3/8-16 3/8-16 1/2-13 1/2-13
213 215 213T 215T	5-1/4	4-1/4	5-1/2 7 5-1/2 7	13/32	3-1/2 3-1/2 3-7/8 3-7/8	10-1/4	9-9/16	1-3/8 1-3/8 1-3/8 1-3/8	3 3 3-3/8 3-3/8	3/4	7-3/8	2-3/4 2-3/4 3-1/8 3-1/8	8-1/2	8-1/2	3-1/2	1/4	9	2-3/4	1/2-13
254U 256U 254T 256T	6-1/4	5	5-1/8 10 8-1/8 10	17/32	4-1/16 4-1/16 4-5/16 4-5/16	12-7/8	12-15/16	1-3/8 1-3/8 1-5/8 1-5/8	3-3/4 3-3/4 4 4	1	9-5/8	3-1/2 3-1/2 3-3/4 3-3/4	7-1/4	8-1/2	4-1/4	1/4	10	—	1/2-13
284U 286U 284T 286T 284TS 286TS	7	5-1/2	9-1/2 11 9-1/2 11 9-1/2 11	17/32	5-7/8 5-7/8 4-7/8 4-7/8 3-3/8 3-3/8	14-5/8	14-5/8	1-5/8 1-5/8 1-7/8 1-7/8 1-5/8 1-5/8	4-7/8 4-7/8 4-5/8 4-5/8 3-1/4 3-1/4	1-1/2	13-1/8	4-5/8 4-5/8 4-3/8 4-3/8 3 3	9	10-1/2	4-3/4	1/4	11-1/4	—	1/2-13
324U 326U 324T 326T 324TS 326TS	8	6-1/4	10-1/2 12 10-1/2 12 10-1/2 12	21/32	5-7/8 5-7/8 5-1/2 5-1/2 3-15/16 3-15/16	16-1/2	16-1/2	1-7/8 1-7/8 2-1/8 2-1/8 1-7/8 1-7/8	5-5/8 5-5/8 5-1/4 5-1/4 3-3/4 3-3/4	2	14-1/8	5-3/8 5-3/8 5 5 3-1/2 3-1/2	11	12-1/2	5-1/4	1/4	13-3/8	—	5/8-11
364U 365U 364T 365T 364TS 365TS	9	7	11-1/4 12-1/4 11-1/4 12-1/4 11-1/4 12-1/4	21/32	6-3/4 6-3/4 6-1/4 6-1/4 4 4	18-1/2	18-1/4	2-1/8 2-1/8 2-3/8 2-3/8 1-7/8 1-7/8	6-3/8 6-3/8 5-7/8 5-7/8 3-3/4 3-3/4	2-1/2	15-1/16	6-1/8 6-1/8 5-5/8 5-5/8 3-1/2 3-1/2	11	12-1/2	5-7/8	1/4	13-3/8	—	5/8-11
404U 405U 404T 405T 404TS 405TS	10	8	12-1/4 13-3/4 12-1/4 13-3/4 12-1/4 13-3/4	13/16	7-3/16 7-3/16 7-5/16 7-5/16 4-1/2 4-1/2	20-5/16	1/8 20 22-3/8 22-3/8	2-3/8 2-3/8 2-7/8 2-7/8 2-1/8 2-1/8	7-1/8 7-1/8 7-1/4 7-1/4 4-1/4 4-1/4	3	18	6-7/8 6-7/8 7 7 4 4	11	12-1/2	6-5/8	1/4	13-7/8	—	5/8-11
444U 445U 444T 445T 447T 449T 444TS 445TS 447TS 449TS	11	9	14-1/2 16-1/2 14-1/2 16-1/2 20 25 14-1/2 16-1/2 20 25	13/16	8-5/8 8-5/8 8-1/2 8-1/2 8-15/16 8-15/16 5-3/16 5-3/16 4-15/16 4-15/16	22-7/8 22-7/8 22-7/8 22-7/8 22-15/16 22-15/16 22-7/8 22-7/8 22-15/16 22-15/16	22-3/8 22-3/8 22-3/8 22-3/8 22-3/8 22-3/8 22-3/4 22-3/4	2-7/8 2-7/8 3-3/8 3-3/8 3-3/8 3-3/8 2-3/8 2-3/8 2-3/8 2-3/8	8-5/8 8-5/8 8-1/2 8-1/2 8-1/2 8-1/2 4-3/4 4-3/4 4-3/4 4-3/4	3 4NPT 4NPT	19-9/16 19-9/16 19-9/16 19-9/16 21-11/16 21-11/16 19-9/16 19-9/16 21-11/16 21-11/16	8-3/8 8-3/8 8-1/4 8-1/4 8-1/4 8-1/4 4-1/2 4-1/2 4-1/2 4-1/2	14	16	7-1/2	1/4	16-3/4	—	5/8-11

Note: ■ * indicates: Slot.

NEMA Motor Frame Dimensions



Notes:
- Drawings represent standard TEFC general purpose motors.
- Dimensions are for reference only.

U	R	S
NEMA Shaft	Keyseat Dimensions	
3/8	21/64	FLAT
1/2	29/64	FLAT
5/8	33/64	3/16
7/8	49/64	3/16
1-1/8	63/64	1/4
1-3/8	1-13/64	5/16
1-5/8	1-13/32	3/8
1-7/8	1-19/32	1/2
2-1/8	1-27/32	1/2
2-3/8	2-1/64	5/8
2-1/2	2-3/16	5/8
2-7/8	2-29/64	3/4
3-3/8	2-7/8	7/8
3-7/8	3-5/16	1

NEMA C-Face	BA Dimensions
143-5TC	2-3/4
182-4TC	3-1/2
213-5TC	4-1/4
254-6TC	4-3/4

5000 Frame	D	E	2F	H	O	P	U	V	AA	AB	BA
5007S	12-1/2	10	22	15/16	26-27/32	30	2-1/2	6-1/2	4-NPT	26-7/8	8-1/2
5007L	12-1/2	10	22	15/16	26-27/32	30	3-7/8	11-1/8	4-NPT	26-7/8	8-1/2
5009S	12-1/2	10	28	15/16	26-27/32	30	2-1/2	6-1/2	4-NPT	26-7/8	8-1/2
5009L	12-1/2	10	28	15/16	26-27/32	30	3-7/8	11-1/8	4-NPT	26-7/8	8-1/2
5011S	12-1/2	10	36	15/16	26-27/32	30	2-1/2	6-1/2	4-NPT	26-7/8	8-1/2
5011L	12-1/2	10	36	15/16	26-27/32	30	3-7/8	11-1/8	4-NPT	26-7/8	8-1/2

Frames Prior to 1963

Frame	D	E	F	N	U	V	BA
66	4-1/8	2-15/16	2-1/2	2-1/4	3/4	2-1/4	3-1/8
203 204	5	4	2-3/4 3-1/4	2-7/16	3/4	2	3-1/8
224 225	5-1/2	4-1/2	3-3/8 3-3/4	3-1/4	1	3	3-1/2
254	6-1/4	5	4-1/8	3-7/16	1-1/8	3-3/8	4-1/4
284	7	5-1/2	4-3/4	4-1/4	1-1/4	3-3/4	4-3/4
324 326	8	6-1/4	5-1/4 6	5-3/8	1-5/8	4-7/8	5-1/4
364 365	9	7	5-5/8 6-1/8	5-5/8	1-78/83	5-3/8	5-7/8
404 405	10	8	6-1/8 6-7/8	6-3/8	2-1/8	6-7/8	6-5/8
444 445	11	9	7-1/4 8-1/4	7-1/8	2-3/8	6-7/8	7-1/2
504 505	12-1/2	10	8 9	8-5/8	2-7/8	8-3/8	8-1/2